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# Intergenerational Distributive Justice and Environmental Responsibility

Ronald M. Green

From the beginning of the nuclear age, through the Pugwash Conferences of the late 1950's, down to the environmental movement of our own decade, scientists have played a leading role in alerting us to the dangers posed by our present habits and technologies. Each problem in what Platt (1969) has termed the "storm of crisis problems" facing mankind today—population growth, resource depletion, environmental degradation, and the control of nuclear energy—has typically first been identified and publicized by members of the scientific community.

Since a distinguishing feature of all these problems is that they threaten massive evil for generations yet unborn, scientists have also performed the important task of reminding us of our moral responsibility to future generations. More than many of us, scientists have been alert to the fact that our moral obligations extend beyond our contemporaries to the generations that will follow us. But although scientists have tended to assume the existence of a responsibility to the future, they have not commonly discussed the more abstract question of the nature of that responsibility, its basis, extent, or limits.

As an ethicist, I want to take the modest step here of remedying this lack of discussion by proposing three very basic guides to our thinking about obligations to the future. I call these "axioms" of intergenerational responsibility. They are so "commonsensical" that I suspect that most scientists concerned with the future already share them. Nevertheless, each does involve some serious conceptual difficulties, and it may be useful to look at these moral axioms with some of the same care that scientists bring to questions of fact.

## BONDS WITH THE FUTURE

The first axiom is: *We are bound by ties of justice to real future persons.*

Even though the belief that we have obligations to future generations is widely held, the very idea of obligations to persons in the future is quite odd. In a discussion of this issue, Stearns (1972) pointed this out when he asked: "Why should there be obligations to future generations? We have made no commitments to them. We have entered no social compacts with them . . . . Under any moral theory, why should there be obligations to nonexistent persons?"

One response to these puzzling questions may be offered by utilitarian moral theory, which reduces all obligation to the single requirement that we act to produce "the greatest happiness for the greatest number of persons" (Mill 1864, Sidgwick 1907). Since, from a utilitarian point of view, it is immaterial where or for whom happiness is produced, this requirement clearly extends to the future and helps explain our obligation to future persons.

Though this may be so, utilitarianism also entails some puzzling difficulties of its own. For example, if we are obligated to maximize happiness, might we not be obligated to multiply the number of persons who could experience happiness? Indeed, so long as the aggregate or overall gains to happiness produced this way proved greater than the corresponding loss to per capita well-being resulting from crowding, a utilitarian approach might even counsel indefinite growth in population. A utilitarian utopia might thus be characterized by burgeoning populations living at or near the subsistence level.

This possible utilitarian conclusion seems to illustrate the old saw that there is no position so foolish that some philosopher has not defended it. But utilitarianism is not just foolish. It represents a serious effort to answer the question of why we should be obligated to persons who are not yet even alive.

Nevertheless, we do not have to accept utilitarianism or its possible conclusions to understand our obligations to the future. In fact, the utilitarian error is a very basic one. Morality does not really involve any kind of lofty commitment to maximizing human happiness, nor even, as some have believed (Narveson 1967), to minimizing suffering. Rather, morality has a far more mundane purpose: It is primarily an instrument for adjudicating possible conflicts between persons and for facilitating a noncoercive settlement of social disputes. It is an effort to replace the play of force and power in human affairs with principles to guide our conduct derived from reasoned, common agreement (Baier 1958, Warnock 1971).

## Moral Reasoning

This understanding of morality is reflected in the recent return by some philosophers to a social contract method of moral reasoning. According to Rawls (1971), for example, moral principles may be thought of as those basic rules agreed to by free, equal, self-interested and rational persons under conditions of strict impartiality. Specifically, Rawls proposes that we view our moral principles as deriving from a hypothetical (not real) contract situation in which each of us seeks best to protect our possible interests. To prevent an unfair distortion of the outcome and to produce a result acceptable to all, however, he asks that we also think of ourselves as deprived of knowledge of our own particular strengths and weaknesses, advantages or disadvantages. The outcome of this hypothetical reasoning process would be a set of principles to which all could agree.

Rawls' view has many complexities, but the basic idea is as familiar as the everyday counsel to "put yourself in the other fellow's shoes." What Rawls is telling us is that if we are rationally to settle our social disputes and to con-

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struct a harmonious social order, we must adopt a moral point of view that involves choosing rationally but impartially before the array of competing interests and claims.

These considerations suggest just why we are obligated to future generations. It is not, as utilitarians mistakenly believe, because we have a duty to promote human happiness. Rather, it is because our wishes and behavior can conflict with those of future persons. We live, after all, in a finite world with limited space, resources, and opportunities, and not even the most optimistic prospects of technological change in the future are likely to remove all limits. By reducing these resources or opportunities, our conduct in the present can injure those who follow us, and they, in turn, in anger, resentment, or ignorance can inflict injury on their descendants.

For these reasons, moral obligations between generations are as important as any obligations we possess. In fact, they clearly form a part of the total requirements of distributive justice that bear upon us; as we must equitably distribute scarce goods and opportunities in the present, so must we do so over time: If we fail to do so, if we neglect our just responsibilities to the future, we risk reducing ongoing human relations to the Hobbesian "war of all with all" that morality aims to prevent.

### Who Is the Future?

As elemental as this understanding is, it has some important implications. For one thing, it suggests that we need not morally concern ourselves with the welfare of merely "possible" future persons—with those human beings whose very coming into existence depends on our reproductive decisions. Persons who will never come into being cannot conceivably occasion social conflict, so merely "possible" persons need not enter into our moral thinking at all. Concretely, this means that there is no such thing as a "right to come into being" or a "right to be born" (Feinberg 1974). It also means that in our collective population decisions we are primarily called upon to minimize injury to *real* future persons. Zero population growth, with its goal of improved life circumstances for smaller future numbers, is a valid conclusion from these basic premises.

Actually, the population issue is a bit more complex than this. Even with merely "possible" persons out of the picture, population policy can involve a

conflict between generations. To some degree, it is in the interests of certain segments of present generations to have unrestrained procreative liberty, whereas it is generally in the interests of future generations to have earlier population growth limited. Apart from the emotional satisfactions produced by children, for example, there are often concrete reasons why parents in agrarian societies opt for numerous offspring. At the same time, larger family size can disadvantage the children themselves, a fact that has led some demographers to speak of the "parental exploitation of children" in the underdeveloped setting (Schultz 1971).

This raises the question of how disputes of this sort are to be settled. The answer, I think, is furnished by the kind of contract method Rawls proposes. Specifically, each of us must ask: "If I were a member of a hypothetical contract situation seeking my possible advantage, but if I were denied knowledge of which generation I live in, what population policy would I propose?" Elsewhere (Green 1976) I have tried to consider this question at length, but a general answer seems clear: In view of the many future generations aided by stationary population levels, and the relatively slight sacrifices imposed on the present, a no-growth policy is a good choice under conditions of radical impartiality. Zero population growth is right. Indeed, negative growth rates to enhance the circumstances of future generations are also justifiable, and it goes without saying that rampant population growth under conditions of poverty is absolutely unacceptable. Quite apart from the question of whether such growth threatens physical survival, the miserable survival it produces is a severe injustice to those born into progressively more impoverished generations.

More important than this almost undisputed conclusion, however, is the method of arriving at it. What I am trying to suggest under the heading of this first axiom is a way of thinking about our obligations to the future and, at the same time, a rational way of determining the extent of those obligations. This method, moreover, is as applicable to other problems of intergenerational justice, including environmental responsibility and resource planning, as it is to population policy. In each of these cases, I suggest, we are called upon to ask a simple question: "Which policy would I find most advan-

tageous if I were deprived of the knowledge of the generation to which I belonged?" Obviously, this question alone will not solve our problems. Complex factual matters must also be faced on each issue, and the expertise of many disciplines must be drawn upon. But it may be of some help at the outset to see that the right question is being asked.

### FUTURE SHOULD BE BETTER

The second axiom is: *The lives of future persons ought ideally to be "better" than our own and certainly no worse.*

Ordinarily, when we act out of respect for other persons, we can at least entertain the possibility that when their turn comes, they will act out of respect for us as well. But virtually no possibility of such reciprocity exists between generations. Except, perhaps, by respecting our memory, future generations cannot really compensate us for the sacrifices we make on their behalf. This consideration has led some philosophers to suggest that human history displays a kind of chronological unfairness; the earliest generations are called upon to make sacrifices whose benefits they can never enjoy (Kant 1785). A similar oddity has been noted by economists and others who have discussed the matter of capital savings for the future. A policy of savings, they observe, benefits every generation but the first, which experiences only sacrifice (Mueller 1974, Rawls 1971).

It is tempting to conclude that policies which disadvantage one individual or group for the sake of others must be unjust. This need not be true. Where circumstances allow no alternative, policies of this sort can be just, and this seems to be the case where obligations to the future are concerned. Not only is restraint on behalf of the future required, but deliberate sacrifices on our part aimed at making life better for all our descendants also are justified.

To see this, we need only regard the choices impartially. We can refuse to sacrifice or save, and we can insist on a strict equality of expectations across generations. This probably is to our advantage if we happen to be in any initial generation when savings are proposed. But it is clearly to our disadvantage if we belong to any subsequent generation. Each of these receives something from its predecessors and benefits generally from the process of savings as the circumstances of life continue to

improve. Deprived of knowledge of the generation to which we belong, therefore, it seems reasonable to opt for some kind of saving policy. Morally this expresses itself as the duty to strive, even at some expense to ourselves, for the betterment of the conditions of life of those who follow us.

My use of the terms *savings* and *betterment* interchangeably may suggest that I construe this duty to improve the welfare of our descendants primarily in economic terms—as some kind of unending growth in material productivity. Certainly, money income and consumer goods of one sort or another are candidates for consideration among the values we ought to increase for our descendants. But they cannot be the sole goods because we know that increase in these goods has characteristically been accompanied by the degradation of other important and choice-worthy values, including human emotional health, cultural richness, and environmental quality.

The fact that many evils associated with an expanding economy are external to any one generation has led some economists to view commodity production and consumption as an undisputed good, something that persons with divergent ends can all support. But any perspective which takes future generations into account must question this emphasis. Even responsible economists today agree that adequate income measurements must encompass the cross-generational costs of environmental deterioration and resource depletion (Dolan 1971, Schumacher 1973, Spengler 1957, 1966).

### The Quality of Life

These considerations raise the complex question of “quality of life.” If we agree that we ought to improve the real quality of life of our descendants, which criteria should we select for doing so? What constitutes a good or “better” life? So many moralists have tried to answer this question, that it would be presumptuous of me to try to resolve it here. But a few modest suggestions may be in order. For one thing, the fact that it is far easier to identify what constitutes a deterioration in the quality of life than what constitutes an improvement makes it minimally incumbent upon us not to worsen the lot of our successors. This means that we must be careful not to squander or dissipate the legacy of natural and cultural values we have inherited from the past. In par-

ticular, we must respect the integrity of our physical environment, since all future progress presumes environmental stability.

In considering the direction actual progress in the future should take, we might keep in mind the fact that, here as elsewhere, moral choice requires a process of impartial but informed reasoning. This means that we must not allow our choices for the future to be guided by narrow preferences and special interest groups. Neither those who would make us into insatiable consumers nor those who would have us all become philosophers deserve our exclusive attention. A realistic assessment of the plurality of human ends must guide our thinking about the world we hand down to the future.

The fact that moral choice requires impartiality, however, does not mean that it presumes ignorance. On the contrary, full general information is essential to sound moral reasoning. Even the hypothetical contractors of Rawls’ theory are assumed to know all the “general laws and theories” that bear on their choices (1971). This means that scientists have a particularly important role in helping us make our choices for the future. True, in choosing goods and weighing values, or even in judging scientific matters outside their areas of competence, scientists have no more expertise than educated laymen (Glass 1965). But within their broad areas of specialization scientists have the vital task of alerting us to the dangers and opportunities in our actions and of identifying for us the natural conditions of human flourishing. In this respect, science is an irreplaceable “instrument of service” (Thimann 1969) to the total moral community.

It may well be that scientific inquiry will inform us that an overall improvement in our condition requires *less* of some of the goods or activities we presently cherish, or even, perhaps, a measure of deliberately programmed austerity and hardship in our lives (DuBos 1965, Potter 1971). Keeping this in mind, we should not forget that it is still our obligation to help improve the lives of those who follow us. Whatever the intent, appeals for an end to economic growth (Boulding 1966, Meadows et al. 1972, Mishan 1967) may have recently had the effect of casting the very idea of progress into disrepute. Although this conclusion is understandable, it can encourage a defection from our obligation to the future. Our re-

sponsibility is not to abandon a striving for progress so much as to identify and develop those areas where significant human progress remains possible.

Whatever positive directions we select for the future, it remains true that we are minimally required not to worsen the future quality of life. Any historical process displaying a retrogression in human prospects would violate the deepest possibilities of the human enterprise. Unfortunately, an unprecedented capacity to inflict deliberate, mammoth, and irreversible injury on our descendants is a distinguishing feature of our era. Our exercise of this capacity is illustrated by our near exhaustion of petroleum resources and by the serious insults we inflict on delicate environmental systems. Among the most vivid illustrations of irresponsibility to the future, however, are the recent proposals for development of a plutonium recycle economy. Since these proposals furnish virtually a textbook case of how *not* to treat our descendants, I want briefly to dwell on them.

### Possibility of a Plutonium Economy

The arguments in favor of a plutonium economy are fairly straightforward. Not only would such an economy enable us to use what is presently a troublesome waste-product of nuclear reactors, but with the development of the Liquid Metal Fast Breeder Reactor (LMFBR) we would be in a position to exploit abundantly available uranium 238 and thus vastly expand our energy resources. This would lower energy costs for decades to come and might also save lives by reducing the number of persons needed for uranium mining (EPA 1974).

The difficulties with this proposal are equally clear. Plutonium is one of the most toxic substances known. Lung burdens no larger than a millionth of a gram (the weight of a grain of pollen) produce cancer in animals with certainty. The problem is exacerbated by the fact that, with a half-life of 24,000 years, plutonium’s radioactivity is undiminished within the span of human imagining (Speth et al. 1974).

The fact that plutonium is virtually unknown in nature also means that we are uniquely responsible for every grain of this substance introduced into the environment. We have been creating plutonium, of course, from the beginning of the nuclear age, because it is a by-product of fission reactions. But the problem would assume new dimensions

if we were to develop a plutonium recycle economy. Not only would this greatly increase the amount of plutonium produced—some projections foresee a cumulative flow of 100,000 tons of plutonium through the fuel cycle within roughly the next half-century—but because this plutonium would be in pure form it would be especially subject to theft and accidental dispersion (Feld 1974, Scheinman 1974). The special safety problems of breeder reactors only further compound the risks.

By even the most conservative standards of intergenerational justice, these proposals seem grossly irresponsible. How can we justify introducing into the environment a substance that can seriously jeopardize the health and lives of countless future generations? The argument advanced at a recent government hearing—that because we will not be dependent on plutonium for more than a few hundred years it “will not be an important problem indefinitely” (EPA 1974)—entirely misses the point. Though we may rely on plutonium for only a relatively brief period, the plutonium produced during that period may be with us indefinitely, and it may jeopardize the lives of many times the number of generations that profit from its use. Assuming there are alternatives to plutonium recycle, it is not the kind of policy that people deprived of knowledge of the generation to which they belong would favor. For a small probability of gain in the earlier generations, they would assume eons of risk to life and health.

It may be objected here that it is not possible to make such long-term calculations of risk. As some have observed, our future is “very open” with all sorts of scientific change possible (Golding 1972, Nielsen 1973). We may someday be in a position to develop protective medical technologies against the somatic and genetic dangers plutonium represents (Garvey 1972).

The reply to this, of course, is that we may. But if we look at the matter impartially, it hardly seems acceptable to embark on programs that presently pose great foreseeable dangers merely in the hope that these dangers will vanish in the future. In matters of intergenerational responsibility, just as in more familiar moral choices, caution is in order where great evils are involved. This suggests that in considering policies that affect the future, we must evaluate our actions in terms of the best *available*

estimate of their consequences (Callahan 1971). By this standard, the proposals for a plutonium economy seem presently unacceptable.

It may finally be objected, however, that this kind of discussion proceeds in a vacuum. There is no such thing as an absolute evil. All the evils of any policy must be weighed against the evils of alternative policies. But any such weighing seems to favor a plutonium economy. All of our present energy alternatives, after all, involve serious risks. Do not the lives of hundreds of persons killed, maimed, or disabled in each generation by coal mining mean anything? And what about the many ordinary citizens whose health is jeopardized and whose lives are cut short by the air pollution caused by fossil fuels?

These are weighty arguments. Certainly it is true that policies involving generations, no less than individual moral choices, require a relative evaluation of goods and evils. Moral choices are always balancing judgments. It is also true that if we regard the matter impartially, it is very difficult to weigh a sure risk to the life and health of a series of present generations against the grave possible risks plutonium holds for future generations. If that were the choice before us, it would be a difficult one indeed. But is that the choice? Must we continue expending lives in order to protect distant future generations?

One answer to this, I suspect, is that the choice before us is not quite as dramatic as the defenders of a plutonium economy (or similar deleterious policies) would have us believe. Many of the present evils to which they allude can be eliminated or substantially reduced if we are prepared to spend money to do so. Thus, the dangers of coal mining and air pollution can both be substantially reduced for a price. Then, too, there is the prospect of developing relatively nonpolluting solar energy (or, less certainly, fusion energy) to replace much of our dependence on fossil fuel. The choice before us, in other words, is not the sacrifice of present life for future life. Rather, it is the choice of accepting material sacrifices in the present—in the form of higher energy and conservation costs—in order to protect the lives and health of our descendants.

By now it is clear that I believe we should choose against plutonium (and, perhaps by extension, any fission energy policy as well). Regarding the matter as though we did not know which genera-

tion were our own, it seems unreasonable to risk our lives and health in countless future generations (and the lives and health of those we love) simply to preserve high material living standards in the present.

Of course, sacrifices in material living standards are important. For some persons, a decline in such living standards can adversely affect life and health. This consideration raises a new question: When sacrifices on behalf of future generations are morally demanded, how shall these sacrifices be distributed? Who shall bear the burden? This digression into the issue of energy policy, therefore, serves as a fitting prelude to consideration of the third axiom of intergenerational justice.

### DISTRIBUTING SACRIFICES FOR THE FUTURE

The third axiom is: *Sacrifices on behalf of the future must be distributed equitably in the present, with special regard for those presently least advantaged.*

From the beginning of my remarks, I have tried to suggest that our obligations to the future are obligations of justice. They form part of the total moral question of how we are to distribute the limited material resources and opportunities our environment affords. There is nothing new in this understanding. It was emphasized almost two centuries ago by Thomas Robert Malthus, one of the pioneers in intergenerational thinking, when he argued against unrestrained procreation. The procreatively irresponsible, Malthus (1802) said, can be thought of as unjustly pushing their numerous offspring forward to the limited places at some future banquet table of life. Recently, in a classic article, Hardin (1968) made the same point by comparing groups or nations with high fertility to abusers of the commons. Even more than Malthus, Hardin's discussion indicates the element of injustice in abuse over time of a shared environment.

However, if we grant that it is unjust to force our excess progeny on others or that it is unjust to consume more than our generation's share of resources, what does this imply for our total moral responsibility and particularly for the question of how we ought to distribute needed sacrifices in the present? Very specifically, can we demand just treatment for the future while neglecting justice in the present? Can we require

some persons to sacrifice on behalf of all our descendants while we refuse to treat those same persons by the strictest standards of justice? Can justice itself be compartmentalized in this way?

I believe the answer to these questions must be no. Just regard for the future is inseparable from just policies in the present. We cannot pick and choose our areas of moral exertion, encouraging or demanding regard for some persons but not for others. Unfortunately, this awareness has sometimes escaped participants in the population and resource debate. From Malthus to Hardin, many proponents of environmental responsibility have been quick to champion just policies protective of the future. But they have sometimes been equally slow to recognize the just claims of less advantaged groups or individuals in the present. In the case of Malthus, this partiality was a deliberate expression of his aristocratic and antidemocratic bias, and it deservedly earned him the enmity of radical defenders of the poor (Meek 1953).

Malthus' followers have not always shared his social preferences. Some have been convinced that restraints on consumption and population are very much to everybody's eventual advantage. Although this may be true, it obscures the fact that just demands on behalf of the future are first of all precisely that—demands. As such, they necessarily bring up the whole question of distributive justice.

### What Distributive Justice Entails

This is all rather abstract, but it has some important concrete implications. Within our own nation it suggests that we must be especially careful to see that when we institute policies to protect the future, we do not disproportionately injure our less advantaged citizens in the present. I do not want to maintain that individuals or families earning less than, say, the median income are being unjustly treated. Justice need not require equality of income (Rawls 1971, Rescher 1967). But certainly departures from equality require justification, and even when they are justified lesser shares of income can frequently generate resentment. To ask our less affluent fellow citizens to bear a special share of the burden of protecting the future, therefore, risks compounding injustice or exacerbating resentment.

We might also keep in mind the fact that the less affluent and the poor often

have fewer reasons to identify with the future generations we seek to protect. Neither inner-city residents nor blue-collar workers, for example, typically enjoy optimum natural environments. One government report recently termed our urban poor as among our environmentally "most endangered" citizens (EPA 1971). Therefore, we should not be surprised if appeals for environmental responsibility go unheeded by members of these groups, or if they reject these appeals as an "elitist" preoccupation.

More serious than this is the fact that the less affluent can rarely afford the special sacrifices needed for the future, although these sacrifices very often tend to fall directly on them. Both in this country and abroad, for example, high fertility is usually associated with low income groups partly because members of these groups have the greatest need for the various kinds of basic security that large families can provide (El-Hamamsy 1972, Gordon and Wyon 1971). However necessary, and however much it may eventually benefit all families, therefore, population limitation can often severely disadvantage low income parents by requiring them to limit the size of their families before alternative social security programs are available and before adequate local health care can guarantee survival of all their children.

The same is true of the related environmental and resource issues. Recently, for example, measures aimed at protecting our environment have tended to strike lower-middle class or poor workers the hardest. Not only can these workers barely afford to pay the extra costs or taxes for these measures, but they often depend for a livelihood on marginal firms whose viability is jeopardized by demands for pollution control or recycling equipment.

The energy issue offers a similar picture. As recent hearings on United States energy policy make clear (FEA 1974), it is the poor and middle class that most sorely feel the bite of added energy costs. Members of these groups tend to pay a large percentage of their income for fuel and gasoline, and they are tied to aging homes or automobiles, whose energy consumption is disproportionately high.

### Implications

All those engaged in efforts to marshal support for programs protective of

future generations should keep these facts in mind. It is not only that we potentially commit an injustice against the less privileged members of our community by causing them to bear a larger share of our intergenerational distributive responsibility. It is also that, in doing so, we endanger our very efforts to protect future generations. When those who are less well-off are treated in a way they regard as unjust, they may respond with resentment and resistance, which can paralyze efforts on behalf of future generations. Indeed, the recent erosion of public support for environmental programs during this recessionary period, and particularly the resistance of lower-middle class workers fearful of losing their jobs, may serve as warning that these dangers are very real.

The third axiom of intergenerational justice has implications for a number of policy issues, ranging from the very specific matter of establishing fair rate schedules for promoting energy conservation to the broader matter of how we can best formulate strategies for eliciting environmental concern. It also has application to the international arena, where it may counsel a change in the tone, if not the content, of demands for population restraint on the part of the poorer nations. These demands rightly proceed from a sense of the injustice of such unrestrained procreation (injustice to *all* our descendants).

But some of the most strident of these demands have been voiced by citizens of other nations or by indigenous elites whose own conduct, not only in matters of population or resource consumption but in a host of other social relations as well, has been morally questionable. Strict justice in the matter of population does not, as some have mistakenly believed and objected (Hardin 1974), require toleration of serious reproductive irresponsibility. Those who fail to limit the number of their offspring are themselves guilty of violating strict standards of justice. The recognition that our objection to this behavior is based on considerations of justice, however, may caution us to be aware of our own inadequacies when we call on the procreatively irresponsible to respect our common future.

### CONCLUSIONS

This is not the place to explore all the implications and applications of these axioms. My aim, instead, has been to present a way of thinking about

intergenerational responsibility. Working out all the details of these axioms and the method that underlies them is an important but separate task. In moral reasoning, as in science, the method of thinking about problems may be more important than specific conclusions, "the act of judging more critical than the judgment" (Bronowski 1956).

Although these three axioms may be taken singly, there is some value in regarding them all together. Like organic life, justice is a seamless web (Neuhaus 1971). If these axioms offer any lesson, it is that, although we are responsible to the future, our efforts to improve the future quality of life must not become an excuse for neglecting our responsibilities to our neighbors in the present.

The last point may have special importance for scientists. Perhaps because they work so closely with the delicate natural systems on which all of our lives depend, or perhaps just because they naturally have "the future in their bones," as C.P. Snow puts it (1959), scientists, and particularly biologists, have been at the forefront of efforts at environmental preservation. In the very urgent task of protecting the environment, however, scientists must be careful not to align themselves with those privileged individuals, groups, or nations whose calls for sacrifice are directed primarily at the poor.

Scientists must also be careful that their efforts to shock us into responsibility do not help generate the "me-first" attitude of survival more appropriate to a battlefield or lifeboat than an ongoing human community. If scientists allow their foresight to be used as an ideology by the privileged, if they fail to keep in mind the strict relationship between justice to the future and justice to the less fortunate in the present, both science and future generations will be the losers.

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